

## REMARKS

Claims 2-20 are pending in the application. In the present amendment, Applicants amend Claims 11 and 14 and present new claims 21 and 22. New claim 21 is a reinstatement of claim 1 of the original application.

The following discussion refers to the original claim 1, which is now the current claim 21.

In item 2 on page 2 of the above-identified Office Action, the Examiner objected to the drawings under 37 C.F.R. 1.83(a). Specifically, the Examiner stated that the drawings must show the memory element and processor.

Applicants note that paragraph 1068 of the specification of the instant application states that "any processor can perform the function." The same paragraph goes on to state that "the functionality of the processor and memory element can be incorporated into the RAKE processor 230," which is shown in the drawings. It is therefore believed that the drawings do meet the requirements of 37 C.F.R. 1.83(a). However, if the Examiner still requires amendment to the drawings, an amended drawing will be submitted at the Examiner's request.

In item 4 on page 3 of the above-identified Office Action the Examiner quotes 35 U.S.C. §103, however, in item 5 on page 3, claims 1, 18, and 20 have been rejected as being fully anticipated by Ling et al. (U.S. Patent No. 6,377,607) under 35 U.S.C. § 102, or, in the alternative, obvious under 35 U.S.C. § 103.

As will be explained below, it is believed that the claims were patentable over the cited art in their original form and, therefore, the claims have not been amended to overcome the references.

Before discussing the prior art in detail, it is believed that a brief review of the invention as claimed, would be helpful. Claim 1 calls for, *inter alia*:

...

determining a gain vector relating the plurality of code symbols and the plurality of pilot symbols in accordance with channel characteristics; and

using the gain vector to determine likelihood values of a designated code symbol...

The present invention exploits channel information in both the received pilot **and the code symbols**, which are data bearing signals, and therefore achieves improved demodulation performance, as measured by gains to signal-to-noise ratio. (Paragraph 1005 of the specification of the instant application.)

As stated in paragraph 1023 of the specification of the instant application, the multipath gain vector is a function of the multipath channel taken by the signals. As further explained in paragraph 1022, the received modulation and pilot symbols are related to each other through a “multipath gain vector” and to the binary code symbols. The gain vector is calculated based on **the ratio of the transmit gain of the pilot channel to the transmit gain of the traffic or data channel**. Para. 1056. The gain vector equation is found in paragraph 1043 (equation 8).

The Ling et al. reference discloses a telecommunications receiver system for decoding a received composite signal having a data signal component and a pilot signal component. The receiver system includes a first circuit for receiving the composite signal and extracting a pilot signal and a data signal from received composite signal. A second circuit calculates a log-likelihood ratio as a function of a channel estimate based on the pilot signal only, and not a code symbol, as recited in claim 1 of the instant application. A third circuit scales the log-likelihood ratio by a predetermined log-likelihood ratio scaling factor and provides an accurate log-likelihood value in response thereto. (Col. 3, line 55 through col. 4, line 4 of Ling et al.).

As shown in Fig. 5 and explained in col. 9, lines 7-51 of Ling et al., the LLR circuit is fed from the C/I computation circuit. The C/I computation circuit receives data samples, pilot samples, and control samples as input. An additional channel estimate input is provided via an output of the lowpass filter 94. The lowpass filter 94 is a pilot signal filter that receives the pilot samples, filters the pilot samples, and provides the channel estimate to the C/I computation circuit 92 in response thereto. The C/I computation circuit 92 outputs a C/I ratio to the LLR circuit 96 in response to the receipt of the data samples, pilot samples, and control samples from the receiver of FIG. 2 or 4 and in response to the receipt of the channel estimate from the lowpass filter 94. (Col. 8, line 62 through col. 9, line 5). The C/I computation circuit determines the carrier signal-to-interference ratio, as is detailed in col. 9, lines 49-50, by dividing the average energy per data symbol by the noise variance of the data samples, which is determined **from the pilot samples and not code symbols, as recited in claim 1 of the instant application**. This

value is then fed, along with the lowpass filter 94 output, to the LLR circuit. The equations can be found in col. 9, lines 13-50.

As can be mathematically realized, the gain vector of the present invention is not equivalent to the  $C/I$  ratio of Ling et al. Ling et al. do not exploit channel information in both the received pilot **and code symbols** as does the present invention. Therefore, Ling et al. do not show a gain vector relating the plurality of code symbols and the plurality of pilot symbols in accordance with channel characteristics, as recited in claim 1 of the instant application.

It is accordingly believed to be clear that Ling et al. neither show nor suggest the features of claim 1. Claim 1 is, therefore, believed to be patentable over the art. For at least the same reasons, claims 18 and 20 are also believed to be patentable over the art. The dependent claims are believed to be patentable as well because they all are ultimately dependent on claims 1 or 18.

Finally, Applicants appreciatively acknowledge the Examiner's statement that claims 17 and 19 are allowable subject matter.

## REQUEST FOR ALLOWANCE

In view of the foregoing, Applicants submit that all pending claims in the application are patentable. Accordingly, reconsideration and allowance of this application are earnestly solicited. Should any issues remain unresolved, the Examiner is encouraged to telephone the undersigned at the number provided below.

Respectfully submitted,

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